

REMARKS/ARGUMENTS

This application has been carefully considered in view of the Final Office Action mailed August 19, 2009. As a result, minor amendments have been made to the claims to further distinguish the claims over the prior art cited by the Examiner. Claims 1-12 remain pending, claim 1 has been cancelled and new claim 14 added. No new matter is being presented.

Claims 1, 2, 5-10 have been rejected under 35 USC 102(b) over Onoue, US Patent 6,208,104. Claim 3 has been rejected under 35 USC 103(a) as being obvious when considered with respect to the teaches of Onoue. Claims 4 and 13 have been rejected under 35 USC 103(a) as being obvious in view of the teachings of Onoue when further considered with the teachings of Muller, US Patent 4,794,513. Claims 11 and 12 have been rejected as being obvious over Onoue in view of the teachings of Niedermayr, US Patent 4,611,296.

The references cited by the Examiner have been considered but are not believed to teach the elements of the present invention as claimed. The current amendment clarifies that the digital interface (14) is used for serializing the output signal of the position sensor (12) and that the interfaces are "interface cards". Further, the interface cards are positioned adjacent to or within the arm of the robot and is thus positioned between the arm of the robot and the controller (C).

With the present invention, the controller is a structural unit which includes the power module (22), the power module control cards (34), the calculation and processing unit (26), the control card (30) and the PCI bus (28). The controller controls the arm (A) by way of electrical supply to the motors of the arm.

Therefore, it is necessary to control the power modules (22) by the calculation and processing unit (26) and to provide feedback signals from the sensors (12) of the arm to the control unit (30). Claim 1 has thus been amended to specifically make reference to the controller, the calculation and processing unit (26), which together with the power modules (22) are included in the controller, and the control unit (30) which is associated with the calculation and processing unit (26).

It is the purpose of the invention to make the connection between a controller and an arm of a robot as efficient and easy as possible. To this end, the controller includes power supply modules (22) and control means (26, 30, 34) and the robot arm includes, or has adjacent thereto, sensors (12) and corresponding interface cards (14). The digital interface cards are used to serialize output signals of the associated sensors. Further, because of the single functional bus (B), all the information circulating on the bus may be sent at the single frequency of the bus. This information allows calculation and processing unit (26) to control the power modules (22) by way of dedicated signals and feedback signals transmitted from the arm via the digital interface cards (14) to the control unit (30) or alternatively, directly from the power modules (22). All the dedicated and feedback signals are thus transmitted at a single frequency, namely that of the bus (B). There is no such teaching in the reference to Onoue.

In Onoue, there is no element(s) which correspond to the interface cards (14) of the present invention. The interfaces (104, 105, 208, 209 and 503) of Onoue are remote from the robot arm and are not associated with a position sensor of the arm. The only position sensor of Onoue is shown in Fig. 3, is the encoder (618) of the robot body (600). Also the interfaces of

Onoue are not used to serialize output signals of a position sensor, as is the case with the present invention. Any signal emitted by the encoder (618) appears to be already serialized to circulate on the electrical line (601) between the robot body and the servo unit (500) and on the vertical line within the servo unit shown in Fig. 3 and the other lines (400, 520) thereof.

In the office action the Examiner references column 2, lines 49-67, column 7 lines 11-15 and column 7 lines 16-26 of Onoue as showing a serialized output from a sensor, however, from a review of these passages, it is not apparent how such a teaching is present. These passages appear to be or concern instructional data that is provided by a control part to the driver (507) of the servo unit (500) and not data from a sensor, as is the case with the present invention.

Additionally, it is respectfully submitted that there is no element in Onoue similar to the Controller C of the present invention which includes power supply modules (22). The only part of Onoue which includes a power supply unit (508) is the servo unit (500) which is not provided with a calculation and processing unit that is used to compute movements of the arm and to generate control signals for the power modules, as is the case of the unit (26) of the present invention. In Onoue, computation of the control signals is performed by the processing unit (101) of the controlling means (100) which are located outside of the servo unit (500). Thus, the teaching of Onoue are that a common storage device (106) includes robot operating data and robot moving data both of which are accessible by the controlling means (100) and the operating means (200)

Also, it is not believed that Onoue teaches a single functional bus similar to bus (B) of the present invention. The Examiner has identified at page 3 of the final office action does not connect a control unit associated with a calculation and processing unit both to a power supply module and to a digital interface card, as is the case with the present invention. The single function bus (B) of the present invention enables control of the power modules by the calculation and processing unit and transmission of feedback signal from the arm of the robot to the control unit and/or to the power modules at a frequency of the single bus.

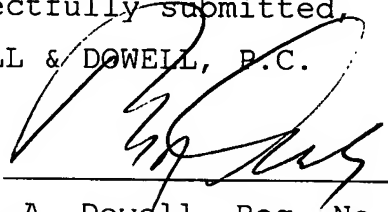
To reiterate, the interfaces (102, 103, 208, 209 and 503) of Onoue cannot be used to serialize output signals of the encoder (618) as all these interfaces, but for (503), are accessible in parallel from the line connecting the encoder to the other elements. Further, even the interface (503) of the servo unit (500) does not serialize output signals of the encoder as such signals circulate on the vertical bus of the servo unit toward the CPU (504) or towards the memories (505, 506) without passing through the interface.

In view of the foregoing, Onoue does not teach a combination of an interface card, controller and single function bus equivalent to those of the presently claimed invention. Therefore, reconsideration and withdrawal of the grounds of rejection under both 35 USC 102(b) and 103(a) is respectfully solicited. The secondary references have also been considered but, even if combined with the teaching of Onoue, do not anticipate the claimed invention for the reasons set forth above.

This response is being filed concurrently with a request for a one month extension of time and a Request for Continued

Examination. Should the Examiner have any questions concerning this response, the amendments submitted herewith of the allowability of the claims, it would be appreciate if the Examiner would contact the undersigned attorney of record. The attorney of record is available for a personal interview to facilitate the further prosecution of this application.

Respectfully submitted,
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